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COMMITTEE OF EXPERTS ON THE TRANSPORT OF DANGEROUS GOODS
Sub-Committee of Experts on the Transport of Dangerous Goods
(Thirteenth session, Geneva, 7-17 July 1997, agenda item 3 (a))

DRAFT AMENDMENTS TO THE MODEL REGULATIONS

Use of frangible disks

Transmitted by the Expert from Spain

1.- It is proposed to add a new chapter 6.6.2.11.2 to chapter 6.6 of the restructured recommendations of the United Nations, which would say the following:

Frangible disks if used before a pressure relief valve as specified in point 6.6.2.8.3. shall meet at least the following two conditions:

- Not to be fragmentable
- Able to resist absolute vacuum

Justification: There exist some types of frangible disks, for example those made of graphite, which breaking due to overpressure, fracture into pieces and these pieces may obstruct or interfere with the correct operation of the pressure relief valve. On the other hand, the fragments of these frangible disks may fall into the product that the tank contains, producing a dangerous reaction in determined cases.

It has to be taken into account, that point 6.6.2.8.3 of the recommendations requests the compatibility of the material of the pressure relief devices, including frangible disks, with the material to be transported in the mobile tank; but the practice is that tanks equipped with those devices are type approved to transport lots of materials of different classes, consequently it is necessary that the frangible disk is compatible with all the materials to be transported and not only with a certain number of those materials. This is very difficult to attain, if the uses disks are not metallic frangible disks protected by a teflon lamina or another adequate corrosion-resisting metallic material such as HASTELLOY C or similar when the mobile tank is used to convey not only materials of class 6.1.3, but also products of class 8.

In some determined cases grids or other devices are used in order to avoid that fragments of a broken frangible disk may fall into the mobile tank, but this practice does not resolve the problem it makes it even worse, as the working surface of the pressure relief valve is reduced and enables the obstruction of the valve. Even though the before mentioned grids are made of stainless steel, they disappear in the presence of corrosive materials and therefore do not resolve the exposed safety problem.

On the other side, the operation of discharge of mobile tanks in some occasions is carried out by gravity or pumps, circumstances which may cause a vacuum, which not only damage the tank, but also may damage the frangible disk. Therefore the frangible disk must be designed to resist vacuum or contain a device which avoids, that a vacuum generated in the interior of the tank bursts off the disk or effects its performance.

Some codes, as for example ASME code prohibit for tanks, among other cases, the use of fragmentable frangible disks, but it is not forbidden by all the design codes. Therefore it is convenient and necessary to define better within the recommendations of the United Nations the frangible disks of mobile tanks used for the transport of hazardous goods. Specially if not only IMDG code but also ADR and RID requires that many chemical products must be conveyed in air-sealed tanks or those which are considered air-sealed. But at the same time these tanks mandatorily requires a pressure relief valve, which at the same time requires a frangible disk, of course with all technical safety and operational warranty.

2.- With the same arguments exposed above and for similar reasons it is proposed a new point 6.6.3.7.3.1 saying:

-<u>The used frangible disks shall meet at least the following two conditions</u>:

* <u>Not to be fragmentable</u>

* <u>Be able to resist absolute vacuum</u>

3.- It is also proposed to substitute in all the points of chapter 6.6 the term "frangible disk" by the term "burst disk" for being a more common and understandable term.

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**COMMITTEE OF EXPERTS ON THE
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**Sub-Committee of Experts on the
Transport of Dangerous Goods
(Thirteenth session,
Geneva, 7-17 July 1997,
agenda item (5 (b))**

GLOBAL HARMONIZATION OF SYSTEMS OF CLASSIFICATION AND LABELLING OF CHEMICALS

Physical Hazards

Harmonised definition of aerosols

Transmitted by the Expert of the United Kingdom

Introduction

1. The third meetings of the Flammability and Reactivity Working Groups of the UN Committee of Experts in the Transport of Dangerous Goods were held in Geneva in December 1996. The work of these groups is reported in ST/SG/AC.10/23/Add.4. The two Working Groups have now been combined, and one of the outstanding issues to be discussed by the new combined group is a harmonised definition of aerosols.

Definition of 'aerosol'.

2. It is clear from previous discussions at the Flammability Working Group that there is considerable scope for confusion when the term 'aerosol' is used. For some, 'aerosol' means simply the physical state of a suspension of liquid or solid particles in a gas, and this is the correct scientific use of the term. For others, though, 'aerosols' is used as a shorthand for 'aerosol dispensers', the articles which contain components which, upon release, form true aerosol suspensions of liquid/solid particles in a gas.

3. The various existing definitions are shown in the annex to this proposal: the definitions are all very similar, except for five minor differences:

the UN definition is the only one which recognises the potential for confusion from the world-wide commercial practise of referring to 'aerosol dispensers' as 'aerosols'. It clearly states "Aerosols, this means aerosol dispensers, ..."

the UN specifies within its definition that the aerosol has to have passed a leakproofness test. EC also requires aerosols to be similarly leaktested, but does not include that attribute to be part of the definition

the UN and ICAO definitions specifically include those aerosols which eject their contents "in a gaseous state"

EC uses the term "non-reusable container" whereas UN refers to "non-refillable receptacle"

ICAO further specifies that the release device must be 'self-closing'

Proposal

4. The UN definition is the most general, and also the clearest with respect to the terms 'aerosol' and 'aerosol dispenser'. The phrase "meeting the requirements of 9.8" is not necessary for the definition, and so the following text, based on the UN definition, is proposed as the globally harmonised definition:-

" Aerosols, this means aerosol dispensers, are any non-refillable receptacles made of metal, glass or plastics and containing a gas compressed, liquefied or dissolved under pressure, with or without a liquid, paste or powder, and fitted with a release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste or powder or in a liquid state or in a gaseous state."

ANNEX

Existing definitions.

Special Provision 190: UN Recommendations

" Aerosols, this means aerosol dispensers, are any non-refillable receptacles meeting the requirements of 9.8, made of metal, glass or plastics and containing a gas compressed, liquefied or dissolved under pressure, with or without a liquid, paste or powder, and fitted with a release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste or powder or in a liquid state or in a gaseous state."

Article 2: EC Council Directive 75/324/EEC

"The term 'aerosol dispenser' shall mean any non-reusable container made of metal, glass or plastic and containing a gas compressed, liquefied or dissolved under pressure, with or without a liquid, paste or powder, and fitted with a release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste or powder or in a liquid state."

ICAO Technical Instructions (Part 2 : 2.5.1)

" An aerosol means any non-refillable receptacle made of metal, glass or plastics and containing a gas compressed, liquefied or dissolved under pressure, with or without a liquid, paste or powder, and fitted with a self-closing release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste or powder, or in a liquid state or gaseous state."

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COMMITTEE OF EXPERTS ON THE TRANSPORT OF DANGEROUS GOODS

Sub-Committee of Experts on the Transport of Dangerous Goods
(Thirteenth session,
Geneva, 7-17 July 1997,
agenda item (3 (d))

DRAFT AMENDMENTS TO THE MODEL REGULATIONS ON THE TRANSPORT OF DANGEROUS GOODS

Other draft amendments

Human experience

Transmitted by the Expert of the United Kingdom

Background:

At the seventeenth session of the Committee of Experts (7-16 December 1992) the Expert from the United States submitted a document INF 24 titled "Information paper: Listing and classification of Division 6.1 Poisonous (Toxic) substances based on human experience". The document listed specific substances which were indicated to be ".....substances classified on the basis of human experience....identified in United States regulations".

At the ninth session of the Sub-Committee of experts (4-15 July 1994) the Hazardous Materials Advisory Council (HMAC) submitted a proposal on the classification of dangerous goods based on "human experience" (ST/SG/AC.10/C.3/R.488). Subsequently, at the tenth session of the Sub-Committee (10-20 July 1995), HMAC offered to:

(a) Identify substances which are listed in the Dangerous Goods List of the Recommendations and which were classified on the basis of human experience; and

At the twelfth session of the Sub-Committee (1-12 July 1996), HMAC submitted a further proposal on the classification of dangerous goods based on "human experience" (ST/SG/AC.10/C.3/R.767 and -/Corr.1 and -/Corr.2). Several Experts indicated they might support the idea of identifying substances classified on the basis of human experience by a special provision and the Chairman asked HMAC if it would prepare a more fully developed submission for the nineteenth session of the Committee (2-11 December 1996). This document, ST/SG/AC.10/R.540, was subsequently considered by the Committee.

The Committee decided not to adopt the proposal by HMAC concerning the classification of solutions and mixtures. However, it did agree to insert a new special provision in the entries mentioned in the appendix to the document, specifying that the substances covered by these entries had been classified on the basis of human experience.

Justification:

It is noted that the list of entries mentioned in the appendix to ST/SG/AC.10/R.540 was not intended to be exhaustive. The expert from the United Kingdom would not wish to see such a list proliferate. However, he considers that it would be sensible to apply the special provision to additional entries where toxicity data suggests very clearly that the substances mentioned in those entries were classified on the basis of human experience.

Proposal:

Apply special provision 279 to the following entries: UN 1710 Trichloroethylene, UN 1846 Carbon Tetrachloride, UN 1888 Chloroform, UN 1897 Tetrachloroethylene, UN 2831 1,1,1 - Trichloroethane.

Supporting data:

The current available data for these substances (which are all halogenated hydrocarbons) is as follows:-

UN	SUBSTANCE	LD_{50} orl-rat (mg/kg)	LD_{50} skn-rbt (mg/kg)	LD_{50} ihl rat (ml/m^3)
1710	TRICHLOROETHYLENE	5650	>20000	16900 a/
1846	CARBON TETRACHLORIDE	2350	>20000	16000
1888	CHLOROFORM	908	>20000	19540
1897	TETRACHLOROETHYLENE	2629	>3228 b/	5042 c/
2831	1,1,1-TRICHLOROETHANE	9600	15800 d/	36000

a/ This is a "mouse (mus)" figure, not a rat.

b/ The literature reference refers to a "Lethal dose (LD)" rather than "LD_{50}"

c/ This is an eight hour figure.

d/ This is a LD_{LO} rather than LD_{50} figure.

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Sub-Committee of Experts on the Transport of Dangerous Goods
(Thirteenth session,
Geneva, 7-17 July 1997,
agenda item (3 (d))

DRAFT AMENDMENTS TO THE MODEL REGULATIONS ON THE TRANSPORT OF DANGEROUS GOODS

Other draft amendments

Human experience

Transmitted by the Expert of the United Kingdom

Corrigendum

At the top of page 2, add the following text to read:

" (b) Develop text which would provide basic guidance in the Recommendations regarding the classification of mixtures and solutions containing such substances."